U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: Polites mardon

COMMON NAME: Mardon skipper

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: October 2005

STATUS/ACTION
___ Species assessment- determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X_ Continuing candidate
___ Non-petitioned
_X_ Petitioned - Date petition received: 12/11/02
__ 90-day positive - FR date:
__ 12-month warranted but precluded - FR date:
__ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted YES
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? YES
c. If the answer to a. and b. is yes, provide an explanantion of why the action is precluded. We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs). During the past 12 months, almost our entire national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, meeting statutory deadlines for petition findings or listing determinations, emergency listing evaluations and determinations, and essential litigation-related, administrative, and program management tasks. We will continue to monitor the status of this species as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures. For information on listing actions taken over the past 12 months, see the discussion of "Progress on Revising the Lists," in the current CNOR which can be viewed on our Internet website (http://endangered.fws.gov/).

N/A Listing priority change
Former LP: ___

New LP: ___

Latest Date species became a Candidate: 10/25/99

N/A Candidate removal: Former LP: ___

___ A - Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___ F - Range is no longer a U.S. territory.

___ I Insufficient information exists on biological vulnerability and threats to support listing.

___ M - Taxon mistakenly included in past notice of review.

___ N - Taxon may not meet the Act's definition of "species."

___ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Insect; Hesperiidae (Skippers)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Washington, Oregon, and California

CURRENT STATES/ COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Klickitat, Pierce, Skamania, Thurston and Yakima Counties, Washington, Jackson and Klamath Counties, Oregon, and Del Norte County, California

LAND OWNERSHIP: Most of the sites occur on Federal lands, however, State, Tribal, and private lands also have occurrences. In the following states, land ownership includes:

Washington: Department of Defense (Fort Lewis Army Base) (5%), Washington Department of Fish and Wildlife (5%), Yakama Indian Reservation (1%), private (1%), USDA Forest Service (58%).

Oregon: USDA Forest Service, Bureau of Land Management (18%), and private ownership (2%).

California: Redwood National Park (5%), USDA Forest Service Six Rivers National Forest (5%).

LEAD REGION CONTACT: Paul Phifer (503/872-2823)

LEAD FIELD OFFICE CONTACT: Western Washington Fish and Wildlife Office, Ted Thomas (360/753-4327)

BIOLOGICAL INFORMATION:

Species Description

The Mardon skipper (*Polites mardon*) is a small, nonmigratory butterfly that was first described by W. H. Edwards (1881) (Pyle 2002, Black *et al*. 2002). This tawny-orange butterfly has a

stout, hairy body. Less than 1 inch across, the Mardon skipper is more compact, with shorter, rounder wings than other skippers (Pyle 2002). The upper surfaces of the wings are orange with broad dark borders. The lower surfaces are light tan orange, with a distinctive pattern of light yellow to white rectangular spots (Potter *et al*. 1999).

Taxonomy

The original description of the species was made by Edwards in 1881. The type specimens of *Polites mardon* were based on three males and three females taken from grasslands near Tenino, Washington by H.K. Morrison in 1880. The subspecies *P. mardon klamathensis* was named from specimens collected near the current Soda Mountain sites in Jackson County, OR (Mattoon et al. 1998). Only the butterflies known from southern Oregon are of the subspecies *P. m. klamathensis*.

Habitat/Life History

The Mardon skipper spends its entire life cycle in one location; it does not migrate. Dispersal distance is unknown, but is believed to be limited. After mating, females deposit their eggs into tufts of bunchgrass (*Festuca* spp.) (Ann Potter, Washington Department of Fish and Wildlife (WDFW), pers. comm. 2003). Eggs hatch after 6 or 7 days (Newcomer 1966; Black *et al*. 2002). Larvae feed on fescue grass for approximately 3 months (Dornfeld 1980; Black *et al*. 2002). Pupae hibernate through winter, probably in a loose cocoon in the grass (Newcomer 1966).

Adults feed on nectar from a variety of herbaceous plants (Black *et al*. 2002), although they prefer the early blue violet (*Viola adunca*) (Pyle 2002). The early blue violet and common vetch (Vicia sativa) were strongly preferred as nectar sources, and Scot's broom (*Cytisus scoparius*) was strongly avoided (Hays et al. 2000; Black et al. 2002). Nectaring was also observed on common camas (*Camassia quamash*), prairie lupine (*Lupinus lepidus*), fine-leaved desert parsley (*Lomatium utriculatum*), western buttercup (*Ranunculus occidentalis*), and Idaho blue-eyed-grass (*Sisyrinchium idahoense*).

In the southern Cascades of Washington, adults have frequently been observed nectaring on vetch (*Vicia* spp.), penstemon (*Penstemon* spp.), and sego lily (*Calochortus* spp.) (Potter and Fleckenstein 2002). Wallflower (*Erysimum capitatum*), hawkweed (*Hieracium* sp.), hawksbeard (*Crepis* sp.), geranium (*Geranium* sp.), fleabane (*Erigeron* sp.) and yarrow (*Achillea millefolium*) are also reported nectar sources from this region (Newcomer 1966; Potter and Fleckenstein 2002). Mardon skipper larvae feed on species of bunchgrass, including Roemer's fescue (*Festuca roemeri*), Idaho fescue (*Festuca idahoensis*), and red fescue (*Festuca rubra*) (Pyle 1989; A. Potter, pers. comm. 2003).

In 2001 surveys, the most common flowers used for nectar by Mardon skippers in habitats near Mt. Adams were *Vicia* spp. and *Fragaria* spp. (strawberry). Nectar species observations are not available for California and Oregon (Harke 2001).

On south Puget Sound prairies, Mardon skippers are found in open, glacial outwash grasslands with abundant *Festuca roemeri* interspersed with *Viola adunca* (Potter *et al.* 1999; Black *et al.*

2002). In the southern Cascades, the Mardon skipper is found in open grasslands within ponderosa pine (*Pinus ponderosa*) savanna/woodland or in the grand fir (*Abies grandis*) zone at elevations ranging from 549 to 1,677 meters (m) (1,800 to 5,500 feet (ft)) (Harke 2001; Potter and Fleckenstein 2002). To date, all occupied sites in the southern Washington Cascades have been found within 56 kilometers (km) (35 miles (mi)) of Mt. Adams. Sites with grassland vegetation, including meadows, grassy forest openings, roadside meadows, and grass-dominated tree plantations, support Mardon skipper populations. Southern Cascade sites vary in size from small 0.25 hectare (ha) (0.5 acre (ac)) or less meadows to large grassland complexes. Site conditions range from dry, open ridgetops to grasslands associated with wetlands, springs, or riparian habitat.

Populations in southern Oregon occupy small (less than 0.25 - 4 ha (0.5-10 ac)) high-elevation (1,372-1,555 m (4,500-5,100 ft)) grassy meadows within mixed conifer forests.

The California populations are located on serpentine balds dominated by *Festuca idahoensis* in sparse Jeffery pine forests. In each of these areas, frequent low-intensity fires have historically played an important role in maintaining the grassland plant communities.

Historical and Current Range/Distribution

The Mardon skipper is a northwestern butterfly with a remarkably disjunct range. The species was historically and is currently known from four widely separated locations: the south Puget Sound region of Washington, the southern Washington Cascades, the Siskiyou Mountains of southern Oregon, and coastal northern California (Black *et al.* 2002).
In Washington, the historic range and abundance of Mardon skippers is not known, and there are no known estimates of abundance prior to 1980 (Black *et al.* 2002). Mardon skippers are apparently extirpated from five historic sites (four in the south Puget Sound region and one in the southern Cascades) (Potter *et al.* 1999). Historically, Mardon skippers were collected from Thurston, Klickitat, and Yakima Counties. Currently, Mardon skippers occupy sites in Thurston, Pierce, Klickitat, Skamania, and Yakima Counties (Potter *et al.* 1999).

South Puget Sound Prairie In 1998, 17 individuals were counted on a 100-ha (247-ac site) in Pierce County. In Thurston County, there were an estimated 5–10 adults at one 2 to 4 ha (5 to 10 ac) site and an estimated 50–80 adults at a second 8 to 12 ha (20 to 30 ac) site. No Mardon skippers were found at four historic sites surveyed in 1998 (Potter *et al.* 1999).

In May and June 2001, two sites were surveyed in Thurston County; no Mardon skippers were detected at one site (40 ha (100 ac)) and 144 Mardon skippers (highest of 3 counts) were detected at the second site (11 ha (26 ac)). Surveys conducted in 2002 through 2004, found Mardon skippers at all three known south Puget Sound locations (Thurston and Pierce Counties) (A. Potter, pers. comm. 2004). Continued searches from 2002-2004 at 4 south Puget Sound historic locales have not found Mardon skippers (A. Potter pers. comm. 2004). Fort Lewis (DoD) biological staff and The Nature Conservancy (TNC) of Washington conducted comprehensive searches on potential Fort Lewis locations (except those within the Artillery Impact Area) in 2003: no Mardon skippers were located (Morgenweck and Dunn 2003).

Southern Washington Cascades In 1998, Mardon skippers were found at six of eight sites surveyed. More than 100 adults were estimated to occur at one site, but estimates of adults for the other 5 sites ranged from 5–50 individuals (Potter *et al.* 1999). In 2001, surveys for Mardon skippers were increased and 29 sites surveyed, Mardon skippers were documented at 13. The number of Mardon skippers observed at occupied sites ranged from 1 or 2 individuals to more than 180 individuals. All of these sites were located near Mt. Adams in the grand fir zone. One new site, on the southern slopes of Mt. Adams at 1,707 m (5,600 ft), represents the highest elevation record for the species (Harke 2001).

Prior to 2002, all known sites in the southern Washington Cascades were located east of the Cascade crest. Surveys in 2002 located 10 new sites near Mt. Adams, including 6 sites west of the Cascade crest in the upper Cispus River drainage. Surveys in 2003 by the WDFW and U.S. Forest Service staff were conducted on the Gifford Pinchot National Forest where two new locations of Mardon skippers were discovered within the Little White Salmon watershed. A new Mardon skipper location was located by WDFW and the Yakama Indian Nation personnel, northeast of Mt. Adams near Mt. Adams Lake (V. Harke, U.S. Fish and Wildlife Service (FWS) pers. comm. 2004). Currently, there are 43 known sites in the southern Cascades of Washington. Fewer than 10 of these sites are known to support populations greater than 50 individuals.

During the field season of 2005, two new locations for the mardon skipper were observed in the southern Washington Cascades. One location was an entirely new site at the Conboy Lake National Wildlife Refuge, near Glenwood, Washington, and the second location was "Lupine Meadow" on the Cowlitz Valley District of the Gifford Pinchot National Forest (Harke FWS, 2005; T. Kogut, Wildlife Biologist, Gifford Pinchot National Forest).

Southern Oregon, Siskiyous Mountains There are now up to 23 Mardon skipper sites in southern Oregon, all within Jackson County. These sites are distributed primarily on BLM lands, and a few Forest Service and private lands. One site was visited in Klamath County during 2005, but weather conditions were not ideal the two times it was visited and no Mardon skippers were observed. The site is a large seasonally wet prairie with abundant nectar plants and bunchgrasses. It is recommended that the site be revisited and surveyed for Mardon skipper. More than 27 historical and new locations were surveyed during 2005 (Ross, 2005). Most of the sites had very few Mardon Skipper. Just 7 of the sites had more than 10 individuals and at one site, 74 individual Mardon Skippers were observed.

Additional surveys were completed by Xerces Society on Rogue River National Forest lands from June 2 through and July 8. Thirty eight locations were surveyed and Mardon skippers were documented from four new sites. These are the only confirmed sites on National Forest lands in southern Oregon for Mardon skipper. At each of the new locations, less than 10 adult butterflies were observed.

Northern Oregon, Columbia River Gorge During the 2003 field season, surveys were conducted on the Mount Hood National Forest on the Oregon side of the Columbia Gorge National Scenic Area. No mardon skippers were located during these surveys. There are no documented occurrences of Mardon skippers in northern Oregon, but the area appears to have suitable grassland habitat for the species (V. Harke, pers. comm. 2004).

Northern California Mardon skippers were present in 1997, but there were no surveys in 1998. In good years, dozens of individuals are found in the 0.4 to 0.8 ha (1 to 2 ac) core area and along a ridge for 3–5 km (2–3 mi) (Potter *et al.* 1999; S. Mattoon and K. Hanson, pers. comm. 1998). Surveys were conducted in Del Norte County, northern California in 2003. At that time, just one known Mardon skipper location was known, in the vicinity of the historic High Divide Ridge location, Del Norte County (E. Runquist, pers. comm. 2004). A new location was discovered in Del Norte County, California, in late May 2004, in Redwood National Park (Robin Hamlin, FWS, pers. comm. 2004), about 10 miles from the location on the High Divide Ridge.

Population Estimates/Status

Estimates of populations are difficult. At many of the sites the number of Mardon skippers counted was usually less than 10 individuals. More intensive surveys would be needed to more thoroughly delineate the population boundaries and estimate population size. Please see the description of population estimates under the specific geographic area.

THREATS:

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Because the Mardon skipper is nonmigratory, and thus relatively sedentary, maintaining occupied habitat quality is essential (Erhlich 1992). Pyle (1989) identified the threats to the Mardon skipper as any factor that degrades its obligate grassland habitats, including development, overgrazing, the use of herbicides and pesticides (*Bacillus thuringiensis* var. *kurstaki* (Btk)), the encroachment of invasive nonnative and native vegetation, and succession from grassland to forest.

Prairies, which once covered hundreds of thousands of acres of the south Puget Sound region prior to settlement, have been lost to development, conversion to other uses (agriculture and gravel mining), fire suppression, and invasion by native and nonnative plant species. Today, less than 3 percent of the original prairie vegetation remains, and much of this has competing human uses (Crawford and Hall 1997).

Invasion and dominance of nonnative plant species into native grasslands is common and has occurred rapidly at several current and historic Mardon skipper locations. Introduced plants threaten the Mardon skipper by directly competing with larval food plants. Many invasive woody shrubs, forbs, and grasses also prevent or obscure access by adults to nectar plants. Invasive, nonnative, sod-forming grasses (such as *Holcus* spp. and *Arrhenatherum elatius*), and weedy forbs, including *Hypochaeris radicata,* threaten native bunchgrasses (*Festuca* spp.) that Mardon skippers depend on for egg deposition, larval food, and hibernaculum structures. The short character of *Festuca* dominated grasslands allows access for the adult butterfly to its similarly short, native nectar sources (Black *et al*. 2002). All Mardon skipper sites have not been evaluated for the presence of aggressive, nonnative plants; however, the problem is increasingly common (Potter *et al.* 1999). Another serious invasive plant threat, tall oat grass (*Arrhenatherum elatius*), has recently spread into much of two south Puget Sound locations

occupied by Mardon skippers, after the sites were mowed to remove Scot's broom (A. Potter and David Hays, WDFW pers. comm. 2004).

The invasive shrub, Scot's broom, poses a threat to grasslands on south Puget Sound prairies and elsewhere because of its ability to form dense stands that exclude native grassland species (Black *et al.* 2002). Parker *et al.* (1997) found a nearly exclusive relationship between Scot's broom and *Festuca roemeri*. Also, due to its highly flammable nature, areas of Scot's broom increase the vulnerability of nearby native plants and butterflies, to high-intensity fire. While intensive management appears to be controlling Scot's broom at two south Puget Sound prairies, this management must be continued for the foreseeable future. Unfortunately, control methods for Scot's broom, which may include hand pulling, herbicide spraying, tractor mowing, or burning, can negatively impact Mardon skippers. Some Mardon skipper eggs, larvae, or pupae, which are immobile and on ground-level vegetation, may be harmed by trampling or heat (Ehrhardt 1985; Dana 1991).

Small, roadside meadows are vulnerable to native species removal and nonnative grass introduction when reseeding occurs after road work. Currently, this threat applies to most southern Oregon and several southern Washington Cascade locations. At least one historic locale in the southern Washington Cascades and a large portion of potential habitat has been destroyed by this practice (Potter *et al*. 1999).

Human structures, including roads and trails, logging landings, helicopter pads, buildings, towers, livestock corrals, trail destinations, and campgrounds are often built in forest openings. Construction in these areas results in direct habitat loss and degradation of remaining habitat. In Washington, roads, trails, and buildings have destroyed habitat at one south Puget South prairie. Helicopter landing pads have removed habitat at two southern Washington Cascade locales. A lookout tower, roads, trails, and buildings are also present at one of these sites. Buildings at two additional southern Cascade locales have significantly reduced the size of available habitat. Roads, trails, and camping areas have destroyed habitat at another. Oregon Siskiyou sites are located adjacent to roads in a highly managed landscape. Therefore, it is likely that these structures and associated human activities threaten southern Oregon populations as well (Potter *et al*. 1999)

Small, isolated populations of sedentary insects, such as the Mardon skipper, are vulnerable to fire (Black *et al*. 2002). Their grassland habitat persisted partly because of repeated, patchy, low-intensity fires. However, large-scale, high-intensity fires would be detrimental through direct mortality of individuals and damage to habitat because of the continuous, rather than patchy distribution of the burn. Large portions of the Pierce County mardon skipper site (one of three extant south Puget Sound sites) burned homogeneously in June 2003 (A. Potter pers. comm. 2004). This unseasonably early fire likely killed all mardon skipper larvae encountered. The site is located on the Fort Lewis Artillery Impact Area where uncontrolled fires regularly occur. However, unusual environmental factors in 2003, including record spring drought and high north winds during the fire's ignition, combined to create an unusually large and intense spring fire that covered much of the mardon-occupied area.

Recreational activities, including walking, horseback and off-road vehicle use, may directly kill

some Mardon skippers (Black *et al*. 2002). These activities also degrade habitat by damaging native plants and opening ground cover for invasion by weeds. Two occupied south Puget Sound prairies, three southern Washington Cascades sites, and one of the California populations (High Divide) are currently threatened by recreational activities (Potter *et al*. 1999).

Livestock grazing may impact Mardon skipper populations through direct trampling of eggs, larvae, pupae, and adults (Black et al. 2002). Larval and adult food sources are destroyed by consumption and trampling by livestock. The native fescue bunch grasses, essential to Mardon skippers, regenerate by seeds that are likely consumed during grazing. Soil disturbance allows invasion by weeds. Grazing occurs on occupied habitat in the southern Cascades, with a significant negative impact on one site, and in the Oregon Siskiyous; however, grazing no longer occurs on occupied sites in the south Puget Sound region (Potter *et al*. 1999).

Insecticide application poses a threat to populations in the south Puget Sound region and the southern Washington Cascades. *Bacillus thurengensis* var. *kurstaki* (Bt or Btk) is a lepidopteran-specific insecticide that is applied in large-scale, aerial applications to control Asian gypsy moth (*Lymantria dispar*) in the Puget Sound region and in the Washington Cascades to control spruce budworm (*Choristoneura occidentalis*). This insecticide has been proposed for use in the Washington and southern Oregon Cascades to control the Douglas-fir tussock moth (*Orygia pseudotsugata*) (Black *et al*. 2002). Although grasslands are not targeted for application, small meadow or savanna/woodlands may receive aerial applications due to the hidden location of small grassland openings within the wooded target area and from drift of the insecticide. Lepidopterans, such as the Mardon skipper, that are single brooded, spring-active species with caterpillars actively feeding during the application period of *Bacillus thurengensis* var. *kurstaki* are especially vulnerable (Wagner and Miller 1995; Black *et al.* 2002). Most of the southern Washington Cascade Mardon skipper sites have either recently been treated or are proposed for *Bacillus thurengensis* var. *kurstaki* applications by Federal, State, tribal and private land managers (Wagner and Miller 1995; Potter *et al*. 1999).

Herbicide use could damage a population by harming larval or adult food sources. One south Puget Sound population and one Oregon population are especially vulnerable because herbicide applications are used to manage vegetation on electrical utility line rights-of-way crossing these sites.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Insect collecting is a valuable component of research, including systematic work, and is often necessary for documenting the existence of populations (Black *et al.* 2002). It is, however, a potential threat to insect populations. Rare butterflies, such as the Mardon skipper, are desirable to collectors. Populations that are small and easily accessible, which is true of most Mardon skipper populations, are especially threatened (Potter *et al.* 1999; Black *et al*. 2002).

Most Mardon skipper populations are small enough in numbers and area that activities of researchers may pose a threat. Trampling can cause direct mortality, and damage to the habitat may lead to additional mortality.

C. Disease or predation.

Disease and predation may be a threat to populations that are suppressed by other factors, but no examples are known for this species.

D. The inadequacy of existing regulatory mechanisms.

Although there is no Washington State Endangered Species Act, the Washington Fish and Wildlife Commission has the authority to list species and provide protection from direct take. However, a species listed in Washington has no associated habitat protection regulation. The Mardon skipper was designated an endangered species in Washington. The Mardon skipper is not listed as a protected species in Oregon or California (Black *et al*. 2002).

E. Other natural or manmade factors affecting its continued existence.

Most insect populations experience large fluctuations in numbers, from year to year and within and between locations. Weather, predation, disease and even the timing of surveys may cause annual changes in butterfly numbers of an order of magnitude (for example, from 1 to 10, 10 to 100, or 100 to 1,000, etc.). Small populations are acutely vulnerable to extirpation from any one of the threats presented above. Locations where Mardon skippers have been extirpated are unlikely to be recolonized because surviving Mardon skipper populations are widely separated, are very small, and are relatively sedentary and do not have the ability to disperse great distances. Almost all remaining Mardon skipper population numbers are small and therefore vulnerable to this process (Potter *et al.* 1999).

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

No conservation agreements have been finalized for the Mardon skipper butterfly. A Candidate Conservation Agreement (CCA/CCAA) is currently being developed for several grassland associated species, including the Mardon skipper. Several agencies, DOD (Fort Lewis Army Base and McChord Air Force Base), WDFW, Washington Department of Natural Resources, Thurston County, Port of Olympia and TNC are collaboratively working with the FWS to develop this agreement. A draft agreement is anticipated during FY 2006.

A small private parcel of prairie land was acquired in FY 2005 with funding from section 6 Recovery lands acquisition funds. This 130 acre parcel will contribute to the conservation of prairie associated species in south Puget Sound. Mardon skipper will be introduced onto this parcel when the captive rearing methods have been improved and larvae are available to move onto the site. TNC will oversee management of the parcel and coordinate with FWS on activities that are planned for the parcel.

In addition, WDFW has received funding and hopes to purchase 600 acres of the West Rocky Prairie, the largest and highest quality remaining south Puget Sound prairie on private lands. WDFW is also planning to purchase an 80-acre private inholding at the Black River-Mima Prairie Glacier Heritage Preserve. WDNR intends to expand the Mima Mounds Natural Area Preserve when they have available funding and willing sellers. TNC recently received a

conservation easement donation on 613 acres of the Cavness ranch on Frost Prairie south of Tenino. Each of these parcels contributes to the conservation of prairie dependent species including the Mardon skipper butterfly.

Restoration of grasslands in the south Puget Sound region of Washington has resulted in temporary control of Scot's broom and other invasive woody plants through the use of herbicides, mowing, grazing, and prescribed fire. The TNC of Washington, with funding from the FWS, has conducted restoration projects on grassland habitat at Fort Lewis Military Reservation, Thurston County's Glacial Heritage Preserve, Scatter Creek Wildlife Area, and the Mima Mounds and Rocky Prairie Natural Area Preserve.

Biologists from the Washington Department of Fish and Wildlife were funded by FWS to implement and refine captive rearing methods for Mardon skipper at the Oregon Zoo. This work has been ongoing for less than 1 year and the early results have not been successful for Mardon skipper. Because of disease problems in the propagation facility, work on mardon skipper has slowed and the focus is to perfect the propagation technique with Taylor's checkerspot, another candidate butterfly.

FWS funded the U.S. Forest Service (USFS) with an Interagency Agreement in late FY 2003. The USFS has implemented habitat restoration projects for the Mardon skipper at two locations on the Gifford Pinchot National Forest. This is a continuation of ongoing work being done by the USFS. In 2005, the FWS coordinated with the Gifford Pinchot National Forest to complete restoration on about 5 acres of Mardon skipper habitat. This work was continuation of work initiated during 2003 to remove trees that have encroached onto the grassland habitat for the Mardon skipper. Habitat for the Mardon skipper is relatively rare on the National Forest lands where approximately 15 acres have been restored during the past three years.

Through an initiative from the Western Washington Fish and Wildlife Office, the FWS has worked with several agencies (Bureau of Land Management (BLM) and U.S. Forest Service in southern Oregon, the U.S. Forest Service on Gifford Pinchot, Mount Hood and Willamette National Forests) to train biologists to survey for Mardon skippers on their lands. This training has increased knowledge, awareness and interest throughout the region to monitor grassland habitat for the Mardon skipper and several new populations have been identified in recent years.

In the spring, 2004, the Arcata Field Office (FWS) funded Eric Runquist, a Ph.D. candidate at University of California, Davis, to search for new populations of Mardon skipper. Mr. Runquist has proposed to search in the vicinity of the original California population near High Divide Ridge, Six Rivers National Forest (R. Hamlin pers. comm. 2004). Locations for Mardon skipper were surveyed in southern Oregon by Forest Service and FWS biologists and by entomologists from the Xerces Society.

A report submitted to the FWS from Dana Ross (2005) summarized the survey effort for Mardon skipper during 2005. A total of 27 locations were surveyed one or more times, including several locations that were surveyed for the first time. Because of the annual variation in flight period for the Mardon skipper, the surveys were conducted at three distinct times within the suspected flight period, from early June through early July 2005. During the early survey period only a

handful of butterflies were observed. The largest number of butterflies was documented during the late June period when a total of 245 male and females were observed at 15 of 21 sites surveyed. Seven new Mardon skipper locations were discovered in Klamath and Jackson County, Oregon. Only one of the seven locations had more than 10 individuals (17 at one Forest Service site).

Land managers with the National Forest System and the BLM began work on a conservation assessment for the Mardon skipper during 2005. This collaboration between the two Federal land management agencies included technical input from the FWS and the WDFW. The USFS and BLM surveyed for the Mardon skipper at several new locations in southern Oregon and have plans to increase their survey effort on suitable habitat that falls within the species range of distribution but have otherwise not been surveyed.

SUMMARY OF THREATS (including reasons for addition or removal from candidacy, if appropriate)

The Mardon skipper spends its entire life cycle in one location, and its dispersal ability is probably limited. Threats include: habitat loss and degradation due to development; overgrazing; use of herbicides and pesticides; encroachment of nonnative and native vegetation; succession from grassland to forest; fire suppression; direct loss of individuals due to fire; recreational activities; insect collecting; and random, naturally occurring events. A limited dispersal ability limits the likelihood of recolonization once a population is lost. The magnitude of threats is high because of the small population sizes and disjunct distributions that limit dispersal. Loss of any of the populations could threaten the continued existence of the species. Threats are non-imminent because the number of documented locations for the species has increased from less than 10 in 1998 to greater than 50 rangewide in 2004. However, only 10 locations have more than 50 individuals. No sites have been specifically dedicated for the management or conservation of the species. We have assigned a listing priority number of 5 to the Mardon skipper.

RECOMMENDED CONSERVATION MEASURES

All current and high priority historic locations for Mardon skipper butterflies should be monitored. Sites that have components of native habitat, bunchgrasses and forbs should be surveyed for the presence of the species. If the species was found to occupy a site, a formal survey or a complete assessment of the site should be made. Management actions that improve the amount and distribution of suitable habitat for Mardon skipper butterflies are recommended. Management would include mowing (usually early fall or pre-emergence of larvae in the spring), prescribed burning of patches but never more than about ¼ of the site in any one year to conserve eggs and larvae, and judicious use of herbicides are all recommended procedures for improving habitat. The acquisition of grassland and bald habitat should be a high priority to conserve Mardon skipper.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	**5***
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: The magnitude of the threat is high because of the small size of all populations and their disjunct distribution. The great distances between the known locations for the species would not allow for dispersal of the species between populations to replace individuals that were lost. Loss of populations within the distinct regions where the species is found could lead to extirpation of the species at any of these disjunct locations.

Imminence: Each population is faced with numerous current and potential threats that may reduce or eliminate the species from any single location. Conservation measures, including habitat restoration are being implemented for Mardon skipper at some locations, so some locations are improving, while other populations continue to decline and other populations are still being discovered. The disjunct distribution of the species makes for a discontinuous adult flight period for the species. Therefore, when threats adversely affect the species at one location the species may not have emerged from pupation at another location. For these reasons we consider the threats to Mardon skipper as non-imminent.

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? NO. At this time, emergency listing of the Mardon skipper is not warranted. The number of documented populations of Mardon Skippers has expanded from less than 10 in 1998 to greater than 50 in 2004. New populations have been found in northern California about 10 miles from the currently known population at High Divide Ridge. Mardon skippers have been observed at the grasslands in the south Puget Sound and southern Cascades of Washington, the BLM site on Soda Mountain, and two locations on the Six Rivers National Forest, northern California in 2004. Locations for Mardon skippers in the subalpine meadows/grassland zone of the Cascades have been recently discovered and the potential to

observe new locations appears to be good. The Xerces Society recently provided training to the Willamette NF biologists in June 2004, and to biologists on the Mt. Hood, Gifford Pinchot and Six Rivers National Forest in 2003. There are now more people looking for Mardon skippers. The WWFWO has considered the new information we have received for the Mardon Skipper. The discovery of new populations and the wide geographic range for the Mardon skipper provides a buffer against threats destroying all of the habitat or jeopardizing the existence of the species and that the need for an emergency listing situation does not exist.

DESCRIPTION OF MONITORING:

The Mardon skipper has received considerable attention since it was first put onto the candidate list in October 1999. Based on early work by Dr. Robert Michael Pyle (1989) the Mardon skipper was brought to the attention of WDFW and FWS biologists who have monitored the species on south Puget Sound grasslands since 1996. WDFW biologists in cooperation with Dr. Pyle began searching historic locations for the species in the southern Cascades of Washington in the same year. Since 1996, annual searches in Washington have been conducted by WDFW and FWS biologists at the south Puget Sound and southern Cascades of Washington locations. The loss of the grassland ecosystem was already a concern for the FWS and the Forest Service Pacific Northwest Forest and Range Experiment Station (Olympia), who had begun work on south Puget Sound grasslands in the early 1990s. Early work focused on the changes to the grassland ecosystem and its rare plants (*Castilleja levisecta*, listed as Federally Threatened in 1997) and other former candidate species, *Aster curtus*). Status reviews and research began on several plant, mammal, bird and lepidopteran species that depended on this ecosystem.

Biologists from the USFS (Gifford Pinchot National Forest, (GPNF)) and the FWS Northwest Forest Plan have monitored the species on the GPNF every the summer from 2000 - 2005, where new populations have been found. In the summers of 2002 - 2005, searches were made on Forest Service and BLM lands in Jackson and Klamath Counties, Oregon where Mardon Skippers are known from several locations. FWS biologists from Arcata, California, have been working with National Park Service biologist and lepidopterists, Dr. Sterling Matoon and John Emmel to search for and monitor the species in northern California for the last 2 years. Dr. Matoon, has searched the High Divide Ridge in Del Norte County, California since 1979, when he first discovered the species at this location. Searches in 2004 identified a second population in the Bald Hills region of Redwood National Park, Del Norte County, California, about 10 miles south-southeast of the original population, too great a distance for dispersal from the High Divide population. Fewer than 50 butterflies were observed at this location (R. Hamlin pers. comm. 2004).

COORDINATION WITH STATES

We, the Western Washington Fish and Wildlife Office have coordinated with the Washington Department of Fish and Wildlife on Mardon skipper surveys since 1997 and have periodically funded restoration projects to benefit Mardon skipper at Scatter Creek Wildlife Area, a local prairie site managed by WDFW. In 2001, we funded the WDFW and WDNR with a cooperative agreement to partner with us on surveys for Mardon skipper. WDFW has been instrumental in their coordination with the FWS on Mardon skipper and have taken the lead on field workshops

to train agency and private consultants on survey methods and the identification of Mardon skipper throughout the species range.

The Washington Fish and Wildlife Commission designated Mardon skipper as an endangered species in the state of Washington (Washington Administrative Codes 232-12-014, Endangered species; 232-12-011, Threatened species, Appendix D). This designation provides protection from direct take of the species but does not provide any protection to the habitat where the species is found.

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all 12-month petition findings, additions of species to the candidate list, removal of candidate species, and listing priority changes.

Approve: Acting _____ 11/10/05
Regional Director, Fish and Wildlife Service Date

_____

Concur: _____ August 23, 2006
Director, Fish and Wildlife Service Date

Do not concur: _____ _____
Director, Fish and Wildlife Service Date

Date of annual review: October 6, 2005

Conducted by: T. Thomas